



**United States Environmental Protection Agency
Region 5**

To: Shari Kolak
From: Amy Gahala
Date: 8/22/2017
**Subject: Lake Calumet Cluster Site Group Technical Memorandum: Groundwater
Assessment OU2 Volume 1 and Volume II**

Shari, I have reviewed the above subject line and below are my comments for your consideration.

Summary:

Arcadis investigated the groundwater in and around the LCCS to evaluate the contaminants emanating from LCCS and surrounding contaminated sites such as Paxton I and II landfills, and Land and Lakes Landfills. The data is used to preliminarily evaluate the human and ecological risks at the downgradient Indian Ridge Marsh. Volume II contains all the data collected in the form of appendices to support the conclusions made in the report. The conclusions of the report follow that the site contaminants are no worse than the constituents entering the LCCS. Arcadis concludes that the contaminants within LCCS are likely from the upgradient sources and that remediation or further investigation in and around Indian Ridge Marsh is not needed because LCCS is not responsible and the risk associated with the contaminants at LCCS do not warrant any further investigation into Indian Ridge Marsh.

A few comments regarding report format, edits, and suggested data analyses:

1. On page 2 (and in other locations), the text notes that the shallowest native geologic unit is a low-permeability silty clay underlying the fill. The clay was encountered at every soil boring location and extends to the maximum depth of all the soil borings completed. Please, for the sake of clarity and understanding, state the range of thickness of the silty clay encountered via the borings.
2. Page 2, the text states that the Fill Material is a uniform composition. I find this somewhat dubious. Given the heterogeneity encountered within the soil borings, what is meant by this statement? Please revise for clarity.
3. In Section 2.6, discusses the IEPA preparation of a Focused Feasibility Study and issuance of a ROD that involved a clay cap in 2007. The text states that the cap grading was not completed. In a figure, please provide an outline of the current known capped area completed by the IEPA and the areas in question. Additionally, later discussion in the report refers to cap inspections and seep identification and sampling. Please provide those seep/sampling locations on figure.
4. The figures need to be improved for greater clarity and understanding of conclusions made in the report. The "high" and "low" symbols should ideally be changed to some sort of scale system, preferably the same as the scales used in Appendix J. This will help

illustrate and support the claims presented in the report. As is, it does not lend itself to identifying potential flowpaths, if they indeed exist. Some constituents are much more conservative than others. All the data should be displayed (HPT and MW data) with the highest concentration identified.

5. There was a substantial investigation of the hydraulic conductivity (HPT/slug tests) and vertical aquifer profiling results. The discussion of these results are somewhat lacking. What influences did the hydraulic conductivity have in the Fate and Transport of some constituents? What are the main depths (thicknesses) of the saturated flow portion of the aquifer? Are these saturated flow portions connected with upgradient sources or are there paths that are more tortuous in certain locations?
 - a. Groundwater investigations typically provide cross-sections. This is somewhat done in Appendix J, but there are data gaps within the LCCS (only perimeter data is provided). Cross-sections should be presented to facilitate understanding of the fill/geology within the LCCS site.
6. Is it possible to provide a regional groundwater flow map that includes water level data from Paxton I and II, and Land and Lakes Landfill, and Indian Ridge Marsh? This may help to facilitate a greater understanding of regional flow and contaminant transport from these presumed upgradient sources.
7. The report notes on figure 6 that Indian Ridge Marsh already had past sampling events of the surface water and sediment. Is it possible to have that data on a figure? What COCs were analyzed and detected? How do the concentrations compare to LCCS and the upgradient sources?
8. How might the standing water/surface water on Alburn Incinerator, US Drum and Unnamed Parcel influence the recharge zones and groundwater flow? Are these surface water areas recharge or discharge zones? Have they ever been sampled? The orthographic maps on the figures are from 2013. Updated flyovers from Google Earth show much of the apparent surface water locations have been filled in with vegetation (apparently). Are there any current or future activities at the site that may influence the groundwater/surface water interactions?
9. Other Sites within the vicinity of LCCS have incidences of high pH ($\text{pH} > 12$). Are there any instances of high pH at LCCS? Can the purge- field parameter results be provided in a table?
10. Please provide figure(s) for the locations with exceedances of screening levels for the Illinois Numeric Water Quality Standards for acute and chronic standards. If available, compare these exceedances to concentrations identified from previous investigations at Indian Ridge Marsh.
11. Page 25 discusses a dilution factor from the groundwater reaching the Indian Ridge Marsh surface water. Does that dilution include the concentrations detected at Indian Ridge surface waters? How was that dilution factor determined? Indian Ridge appears to receive surface water discharge from upgradient culverts as indicated on Figure 4 and drains at the outlet culvert under 122nd street. Dilution would primarily come from precipitation. The primary sources for the surface water are groundwater from upgradient sources and surface water runoff through the culverts. With the exception of precipitation, all other sources may have their own contributions of contaminants entering into the Indian Ridge Marsh. Historical images from Google Earth indicate differences in the

apparent water clarity throughout Indian Ridge Marsh, with the southern portion appearing to be more cloudy than the northern portion. The northern portion also appears to be affected by algae more so than the southern portion. These differences may be hinting at the effects from the various upgradient sources of contaminants on the surface water quality.





Arcadis does not think there needs to be further investigation into Indian Ridge Marsh, but they have not presented all the data to support that conclusion. Although there appears to be limited recreational risk, there are still exceedances of chronic/acute aquatic criteria (ecologic risks) that may need to be addressed. The report provided the laboratory report for data collected by Arcadis from Indian Ridge Marsh, at least according to Appendix A in Volume I and Figure 6. This data should be explored further before their conclusions can be considered. Additional data analysis is also recommended to further help facilitate the understanding of the various influences of the sources of contamination at LCCS and the surrounding areas.

If you have any questions, please contact me.

Sincerely,

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